

REMARKS

In view of the above amendments and the remarks advanced below, Applicants respectfully request reconsideration and withdrawal of the rejections of the claims.

Claims 1, 2 and 4-30 currently are pending, with claims 7-16, 19-23 and 26-30 withdrawn from consideration by the Examiner. By the present response, claims 1 and 24 are amended. Support for the amendments is found, for example, on pages 3 and 18-19 in the specification.

In the Office Action, claims 1, 2, 4-6, 17, 18, 24 and 25 are rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Kimura et al. (JP11008437). This rejection is respectfully traversed, as the Kimura document fails to describe all claim limitations set forth in amended independent claims 1 and 24, and in independent claims 4 and 25.

Starting with independent claims 4 and 25, the Examiner continues to assert that the Kimura et al. document teaches the recited feature of “an $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer of the second conductivity type is formed between the second cladding layer and the electrode,” as recited in each of these claims. However, as pointed out in the February 14, 2006, Amendment, Kimura et al. does not describe such a layer. Rather, the layer 111 of Kimura et al. relied upon by the Examiner is made of GaN. See, lines 15-16 of paragraph 0020 and lines 17 to 18 of paragraph 0028, both of which state: “p mold gallium nitride contact layer 111” (emphasis added). The structure relied upon from Kimura et al., therefore, is different from what is recited in claims 4 and 25. Accordingly, the rejection of claims 4 and 25 clearly is improper and should be withdrawn.

Moving on to independent claims 1 and 24, the prior Office Action dated November 14, 2005, identified the undoped layer 202 of the Kimura et al. document as corresponding to the claimed “ $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer of the first conductivity type.” In the Amendment of February 14, 2006, it was argued that the indium mole fraction of Kimura’s active layer is 0.20 and thus Kimura et al. does not describe the claimed relative indium composition between the $\text{In}_x\text{Ga}_{1-x}\text{N}$ and $\text{In}_y\text{Ga}_{1-y}\text{N}$ layers. However, the Examiner now asserts that the $\text{In}_{0.1}\text{Ga}_{0.9}\text{N}$ layer 104 meets the claimed feature of the “ $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer of the first conductivity type.” Further, while the Examiner does not explicitly identify which part of the active layer 107 of Kimura et al. has a mole fraction that is less than or equal to the indium concentration in layer 104, it appears the Examiner is contending that the $\text{In}_{0.05}\text{Ga}_{0.95}\text{N}$ barrier layer(s) of the multiple quantum well layer 107 (see, paragraph 0020) meet the claimed features of “an active layer, which is made of $\text{In}_y\text{Ga}_{1-y}\text{N}$ and is formed over the first cladding layer ...

wherein $0 < x < 1$, $0 < y < 1$ and $x \geq y$ in the composition of In.” It view of the Examiner’s new interpretation of the Kimura et al. publication, and to further distinguish the claimed subject matter from that which is described in this document, each of claims 1 and 24 are amended to recite, “wherein a substantial portion of light-emitting recombination occurs the $\text{In}_y\text{Ga}_{1-y}\text{N}$ active layer material.”

By contrast, a substantial amount of the light-emitting radiation resulting from recombination of carriers does not appear to occur in the barrier layers of the multiple quantum well layer 107 of Kimura et al. Rather, most radiative recombination would appear to take place within the $\text{In}_{0.2}\text{Ga}_{0.8}\text{N}$ material well layer (see paragraph 0020, line 10). For instance, see S. M. Sze, “Physics of Semiconductor Devices,” Chapter 12.5, especially pages 729-730 and Figure 46¹. Furthermore, the 0.2 indium mole fraction of the well layer described in Kimura et al. is greater than the 0.1 indium mole fraction of the $\text{In}_{0.1}\text{Ga}_{0.9}\text{N}$ layer 104, which the Examiner appears to identify as corresponding to the claimed residing between the contact layer 103 and cladding layer 105. Hence, the Kimura et al. document does not describe the recited feature of “wherein $0 < x < 1$, $0 < y < 1$ and $x \geq y$ in the composition of In.”

For at least these reasons, independent claims 1, 4, 24 and 25 are considered allowable.

Claims 2, 3, 5, 6, 17 and 18 depend from one of claims 1 and 4, and are therefore allowable at least for the above reasons, and further for the additional features recited.

Allowance of the present application and prompt notice of the same is respectfully requested without further delay.

Respectfully submitted,

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¹ A copy of S. M. Sze, “Physics of Semiconductor Devices,” Chapter 12.5, pages 724-730 and a PTO 1449 listing the same are attached. The Examiner is requested to initial this citation on the attached PTO 1449 to indicate that she has considered it, and return a copy of the initialed form to the undersigned.